

**APPLICATION FOR UNITED STATES PATENT**

**Inventor(s):** Gordon Jenkins  
339 St. Georges Rd.  
Baltimore, MD 21221  
U.S. Citizen

**Invention:** RECLOSEABLE BAG AND METHOD OF PRODUCTION

LAW OFFICES OF ROYAL W. CRAIG  
10 N. Calvert St.  
Suite 153  
Baltimore, Maryland 21202  
Telephone: (410) 385-2383

### CROSS-REFERENCE TO RELATED APPLICATIONS

The present application derives priority from U.S. Provisional Patent Application No.  
10 60/444,376 for " RECLOSEABLE BAG AND METHOD OF PRODUCTION", filed: February  
10, 2003.

### BACKGROUND OF THE INVENTION

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#### 1. Field of the Invention

The present invention relates to food bags and, more particularly, to a recloseable self-sealing bag for food articles such as crackers and chips that maintains freshness and yet is easy and inexpensive to manufacture using current production processes.

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#### 2. Description of the Background

Plastic bags are used to distribute a wide variety of items. For example, food such as potato and tortilla chips, as well as cookies, crackers and cereal, are frequently sold in disposable plastic bags. Generally, plastic bags are air sealed until opened by the consumer. The air in the  
25 sealed bag provides a protective cushion from external forces which can crush the contents of the bag. This is especially true with potato chips and other similar products.

5           Horizontal and vertical Form, Fill and Seal Machines are commonly used in a production environment to form these packages, fill with product and seal, all in a continuous sequence of operations.

          It is generally known that the freshness of the products can easily be preserved by reclosing an open bag in an attempt to maintain an airtight seal. Consumers typically fold or  
10   twist the open end of the bag and may use a Chip Clip to hold the folded portion in place. Neither method works very well as the folded and/or twisted end inevitably comes undone. More importantly because the Chip Clip is a separate item consumers often find that they don't have one when they need one.

          Some food items are packaged with reclosable zippers. For example, potato chips are  
15   commercially available (H.E.B.®) with a reclosable zipper. The H.E.B. ® chips come in a zippered bag which keeps the chips fresh until the next use. These bags are also made on a Polaris f/f/s machine from Woodman (Decatur, GA), but they require an expensive zipper profile applicator from AMI RecPro (Glenview, IL). AMI RecPro also provides the TopZip™ Proseal® reclosable zipper.

20           U.S. Pat. Nos. 4,812,074 and 4,601,694 disclose such zippers fully integrated into the bag and is a part of the bag's primary sealing mechanism.

          Another method and device is suggested in U.S. Pat. No. 4,909,017, et al., which discloses a method of making a form fill bag having a reclosable fastener thereon. During the manufacturing process reclosable fasteners are attached to the bag in a direction perpendicular to  
25   the flow of the web material. Similarly, U.S. Patent No. 4,810,103 to Bell issued March 7, 1989, shows a resealable bag closure arrangement including an elongated flexible wire (21) arranged in

5 a serpentine configuration and operatively attached to the flexible walls (14) of the bag member  
(13) to form a resealable closure.

The aforementioned methods and apparatus suffer from a number of drawbacks, most notably, that the existing manufacturing plants that utilize a conventional form, fill, and seal machine would need to purchase new equipment or retool their own equipment to add the  
10 capability of attaching a resealable closure. The degree of retooling to accomplish this could be considerable. It would be far more advantageous to provide a more economical way of attaching a resealable fastener as a part of the conventional form, fill, and seal process in a way that requires a minimum of retooling.

15 SUMMARY OF THE INVENTION

It is, therefore, the primary object of the present invention to provide an improved recloseable self-sealing bag for food articles such as crackers and chips that maintains freshness and yet which is easy and inexpensive to manufacture using current production processes.

It is another object to provide a more economical way of attaching a resealable fastener as  
20 a part of the conventional form, fill, and seal process in a way that requires a minimum of retooling.

5            These and other objects are accomplished by a recloseable bag having a front face and a rear face. One or more bendable shape-retaining flat T-shaped spines are stamped and bonded to either the front or rear face of the bag.

             In one embodiment, the T-shaped spines are formed of a bendable plastic shape-retaining polymer material.

10           In a second embodiment, the T-shaped spines are formed of resilient plastic or other compatible material having one or multiple shape-retaining strand materials (i.e. flat or round wire strand(s)) embedded therein.

             An installation machine is also disclosed for simultaneous formation of and heat- or adhesive-application of the flat T-shaped spines to the recloseable self-sealing bag material either  
15           prior to or during the filling and sealing process.

             The present invention's design is simple and straightforward, highly effective, can be economically manufactured, and there is no wasted material in the production process.

#### BRIEF DESCRIPTION OF THE DRAWINGS

20           Other objects, features, and advantages of the present invention will become more apparent from the following detailed description of the preferred embodiments and certain modifications thereof when taken together with the accompanying drawings in which:

5           FIG. 1 is a rear perspective view of the recloseable self-sealing bag 2 for food articles according to one embodiment of the present invention, having two T-shaped spines which are formed of a bendable plastic polymer material.

FIG. 2 is a rear perspective view of an alternative embodiment of a recloseable self-sealing bag 20 for food articles according to the present invention, having two T-shaped spines  
10       which are formed of resilient plastic having a shape-retaining wire strand embedded centrally therein.

FIG. 3 is a side perspective view of an installation machine 100 for installation of the flat T-shaped spines 14 to the recloseable self-sealing bag 2 prior to or during the filling and sealing process.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

15           FIG. 1 is a rear perspective view of the recloseable self-sealing bag 2 for food articles according to one embodiment of the present invention. The recloseable self-sealing bag 2 is folded and formed with a top heat seam 12, bottom heat seam 16 and a center rear heat seam 20,  
20       as are conventional bags. It is produced from film stock by horizontal or vertical form, fill and seal machines. In accordance with this preferred embodiment of the present invention, two flat T-shaped spines 14 are stamped and bonded to the bag on the rear surface in locations that do not interfere with the otherwise conventional seaming process (i.e. each of the two spines 14

5 positioned a short distance beneath the top heat seam 12 and on either side of center rear seam 20).

Each T-shaped spine 14 comprises an upper horizontal section 10 bisected by a downwardly protruding central section 18. Both spines 14 are preferably formed of a bendable plastic shape-retaining polymer material, although other shape-retaining materials will suffice.

10 The T-shaped spines 14 may be bonded to the surface of the bag using conventional heat sealing technology or adhesive. This embodiment is more suitable for installation before imparting the rear heat seam 20 to the bag. Given the T-shaped configuration of the spines and their bendable shape-retaining material, the T-shaped spines 14 reliably hold the bag closed (upon rolling or folding the top of the upper horizontal section 10 of the bag down) or open (upon straightening  
15 the downward central section 18), as desired. The T-shaped spines 14 can be produced in many colors as desired.

FIG. 2 is a rear perspective view of an alternative embodiment of a recloseable self-sealing bag 20 for food articles according to the present invention. As before, the recloseable self-sealing bag 20 of this embodiment is folded and formed with a top heat seam 12, a bottom  
20 heat seam 16, and a center rear heat seam 28. Two flat T-shaped spines 24 are stamped and bonded on the rear surface in locations that do not interfere with the otherwise conventional seaming process (i.e. each of the two spines 24 positioned a short distance beneath the top heat seam 12 and on either side of center rear seam 28).

5           Each T-shaped spine 24 includes an upper horizontal section 30 bisected by a  
downwardly protruding central section 27. In this embodiment the spines 24 are preferably pre-  
formed of a resilient plastic with a shape-retaining strand material 29 embedded centrally therein.  
The shape-retaining strand material 29 can be wire, wire mesh, or a variety of other shape-  
retaining materials. The T-shaped spines 24 are bonded to the surface using conventional heat  
10   sealing technology or adhesive. Again, this embodiment is preferable installed during  
production before imparting the rear heat seam 28 to the bag. As with the previous embodiment,  
the T-shaped configuration of the spines 24 and their bendable shape-retaining material 29, the  
T-shaped spines 24 reliably hold the bag 20 closed (upon rolling or folding the top of the upper  
horizontal section 30 of the bag down) or open (upon straightening the downward central section  
15   27), as desired. The T-shaped spines 24 can be produced in many colors as desired.

While the two preferred embodiments of the present invention that are described herein  
employ two spines on the rear surface of the bag, depending on the size of the bag the number of  
spines may vary. For example, single serving bags may require only one spine and large bags  
may require 2 or more spines. Also, it should be noted that while the embodiments described  
20   herein position the spines on the rear surface of the bag for aesthetic purposes, the spine(s) may  
be positioned on the front surface of the bag.

FIG. 3 is a side perspective view of an installation machine 100 for installation of the flat  
T-shaped spines 14, 24 to the recloseable self-sealing bag 2 either prior to filling and sealing or



5 during the filling and sealing process. The installation machine 100 can be used as a standalone assembly (prior to filling and sealing), or retrofit to an existing horizontal or vertical form, fill and seal (FFS) machine as commonly used in a production environment (for example, the Orpack GL-250 Form-Fill-Seal).

If retrofitting the installation machine 100 to an existing FFS machine, the installation  
10 machine 100 is added into the circuit prior to the bag heat formation (seam sealing) step.

The installation machine 100 includes a feeder spool 109 for feeding a unitary strip of bag material 112 through tension rollers 117 and an alignment spool 111 into a heated hydraulic press 106 with integral cutter arrangement. The bag material 112 is pulled there through by servo-driven feeding motors 104, 105. The servo-driven feeding motors 104, 105 are electrically  
15 connected to the existing programmable controller of the FFS machine (not shown) for programmed operation thereof.

The installation machine 100 also includes feeder spool 107 and feeder spool 108 each for feeding a unitary strip (114 and 116, respectively) of either a bendable plastic shape-retaining polymer material to form the T-shaped spines 14 of FIG. 1 or a resilient plastic with a shape-  
20 retaining strand material 29 embedded centrally therein to form the T-shaped spines 24 of FIG. 2 into the heated hydraulic press 106 in tandem with the bag material 112. The respective strips 114 and 116 enter the press 106 perpendicular to each other. The integral cutter of press 106 cuts the strips 114 and 116 to form the T-shaped spines. The press 106 may further be heated to an

5 appropriate temperature to effect a heat-weld of the T-shaped spines 14, 24 to the respective faces of the bag material 112, or may be equipped with an integral glue applicator for adhesive bonding of the T-shaped spines 14, 24 thereto. The press 106 is mounted on a hydraulic arm 113 for proper stamping force, and the hydraulics are likewise electrically connected to the existing programmable controller of the FFS machine for programmed intermittent operation thereof.

10 With the T-shaped spines 14 or 24 heat welded or adhesively bonded to the bag material 112, the bag material with bonded spines 115 may either be collected on another collection spool (not shown) for later use, or may be fed directly to the next process step in the existing FFS machine.

The illustrated installation machine 100 also includes an elongate feeder spool 102 for  
15 out-feeding the bag material with T-shaped spines 14, 24 adhered thereto into the next process step in the FFS machine.

Having now fully set forth the preferred embodiment and certain modifications of the concept underlying the present invention, various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will obviously occur to those  
20 skilled in the art upon becoming familiar with said underlying concept. It is to be understood, therefore, that the invention may be practiced otherwise than as specifically set forth in the appended claims.